Claim Amendments

1. (currently amended) An apparatus, comprising:

a light source;

a long period Bragg grating that is optically coupled with the light source via a first optical splice; and

an amplification fiber that is optically coupled with the long period Bragg grating via a second optical splice;

wherein the light source and the amplification fiber are arranged in a forward pumped broadband fiber source configuration without a wavelength division multiplexer;

wherein the light source sends one or more pump optical signals to the long period Bragg grating;

wherein the long period Bragg grating transmits the one or more pump optical signals to the amplification fiber;

wherein the amplification fiber absorbs a subset of the one or more pump optical signals and emits one or more output signals toward the light source;

wherein the long period Bragg grating attenuates the one or more output signals.

2. (currently amended) The apparatus of claim 1, wherein the one or more pump optical signals comprise a substantially same first wavelength, wherein the one or more output signals comprise a substantially same second wavelength, wherein the first wavelength and the second wavelength comprise different wavelengths;

wherein the long period Bragg grating comprises a wavelength attenuation range that omits the substantially same first wavelength and comprises the substantially same second wavelength;

wherein the long period Bragg grating transmits the one or more pump optical signal to the amplification fiber;

wherein the long period Bragg grating attenuates the one or more output signals.

3. (previously presented) The apparatus of claim 2, wherein the wavelength attenuation range comprises a plurality of wavelength attenuation sub-ranges, wherein the plurality of wavelength attenuation sub-ranges comprise zero or more wavelength attenuation sub-ranges that overlap.

4. (currently amended) The apparatus of claim 1, wherein the long period Bragg grating comprises a first long period Bragg grating, the apparatus further comprising a second long period Bragg grating;

wherein the first long period Bragg grating is optically coupled with a first side of the amplification fiber via ~~a third~~ the second optical splice, wherein the second long period Bragg grating is optically coupled with a second side of the amplification fiber via a third optical splice;

wherein the first long period Bragg grating attenuates the one or more output signals;

wherein the amplification fiber receives the one or more pump optical signals and transmits one or more residual signals of the one or more pump optical signals to the second long period Bragg grating;

wherein the second long period Bragg grating attenuates the one or more residual signals.

5. (previously presented) The apparatus of claim 4, wherein the one or more output signals comprise one or more first output signals;

wherein the amplification fiber absorbs a subset of the one or more pump optical signals and emits the one or more first output signals toward the first long period Bragg grating and emits one or more second output signals toward the second long period Bragg grating;

wherein the first long period Bragg grating attenuates the one or more first output signals;

wherein the second long period Bragg grating transmits the one or more second output signals to an optical component.

6. (previously presented) The apparatus of claim 5, wherein the one or more first output signals and one or more second output signals comprise a substantially same first wavelength, wherein the one or more pump optical signals and the one or more residual signals comprise a substantially same second wavelength;

wherein the first long period Bragg grating comprises:

a first cladding;

a first core surrounded by the first cladding, wherein the first core couples a subset of the one or more first output signals to the first cladding to attenuate the one or more first output signals; and

a first wavelength attenuation range that comprises the substantially same first wavelength and omits the substantially same second wavelength;

wherein the second long period Bragg grating comprises:

a second cladding;

a second core surrounded by the second cladding, wherein the second core couples a subset of the one or more residual signals to the second cladding to attenuate the one or more residual signals; and

a second wavelength attenuation range that omits the substantially same first wavelength and comprises the substantially same second wavelength.

7. (previously presented) The apparatus of claim 6, wherein the first long period Bragg grating attenuates the one or more first output signals to promote a reduction of backreflection of the one or more first output signals.

8. (previously presented) The apparatus of claim 7 in combination with the optical component, wherein the optical component receives the one or more second output signals from the second long period Bragg grating and returns a subset of the one or more second output signals to the second long period Bragg grating;

wherein the second long period Bragg grating transmits the subset of the one or more second output signals through the amplification fiber to the first long period Bragg grating;

wherein the first long period Bragg grating attenuates the subset of the one or more second output signals to promote a reduction of backreflection of the one or more second output signal.

9. (original) The apparatus of claim 5 in combination with the optical component, wherein the optical component comprises a fiber optic gyroscope.

10. (original) The apparatus of claim 9, wherein the fiber optic gyroscope comprises a scale factor linearity error;

wherein the second long period Bragg grating attenuates the one or more residual signals to promote a reduction of the scale factor linearity error of the fiber optic gyroscope.

11. (currently amended) The apparatus of claim 5, wherein the optical component comprises a first optical component, wherein the one or more residual signals comprise one or more first residual signals, wherein the first optical component redirects the one or more second residual signals and the one or more second output signals back through the second long period Bragg grating, the apparatus further comprising:

a second optical component optically coupled with the second long period Bragg grating;

wherein the second long period Bragg grating receives the one or more first residual signals and the second output signal from the first optical component, wherein the second long period Bragg grating attenuates the one or more first residual signals to create one or more second residual signals;

wherein the second long period Bragg grating attenuates the one or more second residual signals and transmits the one or more second output signals towards the second optical component.

12. (previously presented) The apparatus of claim 11, further comprising:

an optical coupler that is coupled with the second long period Bragg grating; wherein the optical coupler directs the one or more second output signals to the second optical component.

13. (currently amended) The apparatus of claim ~~1~~ 12, wherein the first optical component comprises a multi-function integrated optic chip ~~light source, the long period Bragg grating, and the amplification fiber comprise a portion of a broadband fiber source~~.

14. (previously presented) The apparatus of claim 1, wherein the amplification fiber comprises an erbium-doped fiber.

15. (previously presented) The apparatus of claim 1, wherein the light source comprises a pump diode laser.

16. (currently amended) The apparatus of claim 1, wherein the ~~long period Bragg grating is fusion spliced to the light source and the amplification fiber~~ first and second optical splices comprise first and second fusion splices.

17. (previously presented) The apparatus of claim 1, wherein the long period Bragg grating comprises a cladding and an optical core surrounded by the cladding;

wherein the optical core couples a subset of the one or more output signals to the cladding to attenuate the one or more output signals.

18. (previously presented) The apparatus of claim 1, wherein the long period Bragg grating promotes a reduction of backreflection of the one or more output signals through attenuation of the one or more output signals.

19. (previously presented) The apparatus of claim 18, wherein the light source causes the backreflection of a subset of the one or more output signals and creates one or more backreflected signals, wherein the light source directs the one or more backreflected signals toward the long period Bragg grating;

wherein the long period Bragg grating attenuates the one or more backreflected signals to promote a reduction of oscillation of the one or more output signals.

20. (currently amended) A method, comprising the step of:

promoting a reduction of backreflection of an output signal from an amplification fiber of a forward pumped broadband fiber source through employment of a long period Bragg grating that is optically spliced directly between ~~to~~ the amplification fiber and a light source.

21. (previously presented) The method of claim 20, wherein the step of promoting comprises the step of:

attenuating the output signal through employment of the long period Bragg grating.

22. (previously presented) The method of claim 21, wherein the long period Bragg grating comprises a first long period Bragg grating, the method further comprising the step of:

promoting a reduction of scale factor linearity error for a fiber optic gyroscope through employment of a second long period Bragg grating that is optically spliced to the amplification fiber and the fiber optic gyroscope, wherein the fiber optic gyroscope employs one or more of the one or more output signals.

23. (previously presented) The method of claim 22, wherein the step of promoting the reduction of scale factor linearity error for the fiber optic gyroscope comprises the step of:

attenuating a residual signal from the light source before the residual signal reaches the fiber optic gyroscope.

24. (currently amended) The apparatus of claim ~~1~~ 16, ~~wherein the first and second optical splices comprise fusion splices~~

wherein the light source is optically coupled directly to the long period Bragg grating via the first fusion splice;

wherein the long period Bragg grating is optically coupled directly to the amplification fiber via the second fusion splice.

25. (currently amended) The apparatus of claim 4, wherein the first, second, and third optical splices comprise first, second, and third fusion splices;

wherein the light source is optically coupled directly to the first long period Bragg grating via the first fusion splice;

wherein the first long period Bragg grating is optically coupled directly to the amplification fiber via the second fusion splice;

wherein the amplification fiber is optically coupled directly to the second long period Bragg grating via the third fusion splice.

Remarks

Entry of the above-noted amendments, reconsideration of the application, and allowance of all claims pending are respectfully requested. By this amendment, claims 1, 2, 4, 11, 13, 16, 20, 24, and 25 are amended. These amendments to the claims constitute a bona fide attempt by applicant to advance prosecution of the application and obtain allowance of certain claims, and are in no way meant to acquiesce to the substance of the rejections. Support for the amendments can be found throughout the specification (e.g., page 1, lines 15-17; page 5, lines 9-11; page 7, lines 5-20), figures (e.g., FIGS. 1-2), and claims and thus, no new matter has been added. Claims 1-25 are pending

Claim Rejections - 35 U.S.C. § 103

Claims 1-25 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Vengsarkar (U.S. Patent No. 5,430,817) in view of Orthonos et al. (Artech House, Inc., 1999; "Orthonos") and in further view of Goldberg et al. (U.S. Patent No. 6,731,837; "Goldberg") and Michal et al. (U.S. Patent No. 6,025,915; "Michal"). This rejection is respectfully, but most strenuously, traversed.

Applicant respectfully submits that the Office Action's citations to the applied references, with or without modification or combination, assuming, *arguendo*, that the modification or combination of the Office Action's citations to the applied references is proper, do not teach or suggest the light source and the amplification fiber that are arranged in the forward pumped broadband fiber source configuration without the wavelength division multiplexer, as recited in applicant's independent claim 1.

For explanatory purposes, applicant discusses herein one or more differences between the claimed invention and the Office Action's citations to Vengsarkar, Orthonos, Goldberg, and

Michal. This discussion, however, is in no way meant to acquiesce in any characterization that one or more parts of the Office Action's citations to Vengsarkar, Orthonos, Goldberg, or Michal correspond to the claimed invention.

Vengsarkar (column 3, line 62 to column 4, line 14; FIG. 7) discloses a WDM system. As shown in FIG. 7, pump sources 55 and 56 of Vengsarkar are configured in a pigtail arrangement. Vengsarkar fails to disclose the light source and the amplification fiber that are arranged in the forward pumped broadband fiber source configuration without the wavelength division multiplexer.

Accordingly, the Office Action's citation to Vengsarkar fails to satisfy at least one of the limitations recited in applicant's independent claim 1.

Orthonos discloses known characteristics of long period Bragg gratings. Orthonos fails to disclose the light source and the amplification fiber that are arranged in the forward pumped broadband fiber source configuration without the wavelength division multiplexer.

Accordingly, the Office Action's citation to Orthonos fails to satisfy at least one of the limitations recited in applicant's independent claim 1.

Goldberg discloses fusion splicing for low loss coupling of optical fiber. Goldberg fails to disclose the light source and the amplification fiber that are arranged in the forward pumped broadband fiber source configuration without the wavelength division multiplexer.

Accordingly, the Office Action's citation to Goldberg fails to satisfy at least one of the limitations recited in applicant's independent claim 1.

Michal (column 1, lines 17-29; FIGS. 1 and 5) discloses:

> The typical broadband fiber source used in fiber optic gyros is a reverse pump, single-pass fiber source 100. Such a configuration is shown in FIG. 1. This configuration uses a pump light source 102, such as a pump laser diode, that emits light at a

> given wavelength which is directed through a wavelength division multiplexer (WDM) 104 that has two input leads and two output leads. One of the output leads 106 of the WDM 104 is physically connected to a length of erbium doped fiber (EDF) 108 via splice 107.

Michal discloses a reverse pumped broadband fiber source that uses a wavelength division multiplexer. Michal fails to disclose the light source and the amplification fiber that are arranged in the forward pumped broadband fiber source configuration without the wavelength division multiplexer.

Accordingly, the Office Action's citation to Michal fails to satisfy at least one of the limitations recited in applicant's independent claim 1.

Applicant respectfully submits that the Office Action's citations to Vengsarkar, Orthonos, Goldberg, and Michal do not teach or suggest the light source and the amplification fiber that are arranged in the forward pumped broadband fiber source configuration without the wavelength division multiplexer, as recited in applicant's independent claim 1.

For all the reasons presented above with reference to claim 1, claim 20 is believed neither anticipated nor obvious over the art of record. The corresponding dependent claims are believed allowable for the same reasons as independent claims 1 and 20, as well as for their own additional characterizations.

Withdrawal of the § 103 rejections is therefore respectfully requested.